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Indian Standard

CONFERENCE SYSTEMS

PART 2 ELECTRICAL REQUIREMENTS

UDC 621·391 : 654·025·8 : 725·832

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CONFERENCE SYSTEMS

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CONFERENCE SYSTEMS

PART 2 ELECTRICAL REQUIREMENTS

0. FOREWORD

0.1 This Indian Standard (Part 2) was adopted by the Bureau of Indian Standards on 11 September 1987, after the draft finalized by the Acoustics Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 The purpose of this standard is to prescribe the electrical requirements of the conference systems. The general requirements of the conference systems are covered in Part 1 of this standard.

0.3 The scale for system parameters is given in Appendix A.

0.4 While preparing this standard, assistance has been derived from IEC 84 (C. O .) 18 'Conference systems: Part 2 Electrical requirements', issued by the International Electrotechnical Commission (IEC).

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 2) specifies the basic electrical requirements of audio equipment for conference systems. It covers the complete system as well as the components, such as headphones, microphones, amplification equipment, of which such a system is composed.

2. TERMINOLOGY

2.1 For the purpose of this standard, the terms and definitions given in Part 1 of this standard shall apply.

---

*Rules for rounding off numerical values (*revised*).

3. GENERAL REQUIREMENTS

3.1 Methods of Measurement — Measurements for sound system components, such as headphones and headsets, loudspeakers, amplifiers, etc, shall be made in accordance with the methods of measurement stated in the relevant parts of IS : 9302*.

3.2 Units — The International System of Units (SI units) is used exclusively in this standard.

3.3 Marking and Symbols for Marking

3.3.1 *Marking* — Terminals and controls shall be adequately marked to permit identification of their function, characteristics and polarity. The marking shall be such that it should be possible to adjust the controls and to identify their positions with sufficient accuracy by referring to the information given in the user instructions.

3.3.2 *Symbols for Marking* — Marking should preferably be composed of letter symbols, signs, numbers and colours which are of international usage.

3.4 Personal Safety — The equipment shall comply with the safety requirements of IS : 616-1981†. The system shall have means to limit the average sound pressure level to a value that prevents hearing damage. The maximum peak level shall not exceed 105 dB sound pressure level (SPL).

3.5 Climatic Conditions — Measurements and mechanical checks may be carried out at any combination of temperature, humidity and air pressure within the following limits:

a) Ambient temperature : 15 to 35°C, preferably at 20°C;
b) Relative humidity : 45 to 75 percent; and
c) Air pressure : 86 to 106 kPa.

The conditions mentioned above represent those under which the equipment shall meet the requirements of this document. Over a wider range, the equipment may operate but not meet all of its specifications and it may be permissible to store the equipment under much more extreme conditions.

3.6 Interference

3.6.1 *Radio Interference*

3.6.1.1 *Electromagnetic immunity* — Conference systems potentially may be exposed to radio interference. To indicate that the system has a reasonable protection against this effect when the equipment is operated in an electromagnetic field strength of 1 V/m, at any frequency between 30 kHz and 500 MHz, and with the carrier amplitude modulated 30 percent and at 1 kHz, the signal-to-interference ratio shall be greater than 40 dB, the signal reference level being the rated input level.

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*Characteristics and methods of measurements for sound system equipment.

†Safety requirements for mains operated electronic and related apparatus for household and similar general use (*first revision*).

3.6.1.2 *Interference induced by the conference system* — A conference system may be a source of radio interference. Conference systems may, therefore, be subject to statutory requirements.

3.6.2 *Immunity Against Magnetic Fields* — Conference systems potentially may be exposed to magnetic interference. To indicate that the system has a reasonable protection against this effect, external interference sources having a field strength of:

a) 1 A/m at a frequency of 50 Hz,
b) 0·2 A/m at a frequency of 150 Hz, and
c) 0·1 A/m at frequencies of 250 Hz.

shall produce a noise level of at least 40 dB below the rated input level. This requirement does not apply for headphones with induction coil inputs used in a conference system.

3.6.3 *Immunity Against Light* — Systems using light as signal carrier shall withstand 1 klux of daylight or tungsten light. If wireless infrared transmission systems are to be used, application of high-frequency driven lighting systems should be avoided.

3.7 Conference Room Requirements — The acoustics of the conference room shall be conducive to speech transmission. It is recommended that the ambient noise in an empty room with fixed systems in operation (for example, ventilation, lighting) does not exceed a sound pressure level of 40 dBA. For interpreter booths, the requirements of IS : 11889-1987* shall be met.

3.8 Connectors — For connectors for interconnection of the system not covered by this standard, reference is made to relevant Indian Standards.

3.9 Electrical Matching Values — For electrical matching values not covered by this standard, reference is made to IS : 9302 (Part 10)-1980†.

3.10 Characteristics to be Specified — The characteristics listed in this standard shall be available to the user before purchase of the system.

---

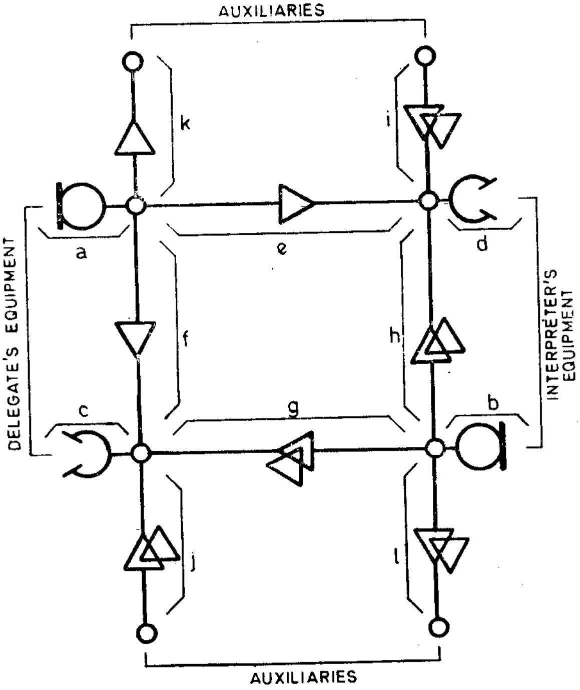
*Booths for simultaneous interpretation — General characteristics and equipment.

†Characteristics and methods of measurements for sound system equipment: Part 10 Preferred matching values for the interconnection of sound system components.

4. ELECTRICAL REQUIREMENTS

4.1 Introduction

This section specifies electrical requirements to be met by conference systems. Desirable characteristics are specified for microphones, headphones and transmission links as individual units (as shown in Fig. 1 and Table 1) as well as for microphones combined with a segment of transmission link (as shown in Fig. 1 and Table 2). For the purpose of definition, transmission links are deemed to embrace all components (amplifiers, controls and any cabling up to a length of 100 m per link) located between the input to and output of the link.



(Double triangles stand for multichannel links)

Fig. 1 Schematic Representation of a System

TABLE 1 INDIVIDUAL UNITS

(*Clause* 4.1)

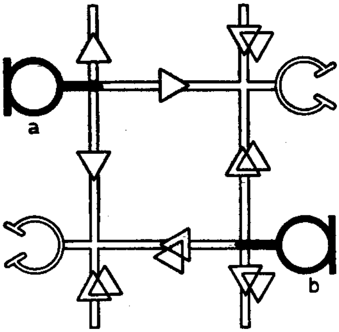
ITEM (1)	DESCRIPTION (2)	SUB-CLAUSE (3)
a	Microphone for delegates	**4.2**
b	Microphone for interpreters	**4.2**
c	Headphone for delegates	**4.3** or **4.4**
d	Headphone for interpreters	**4.3**
e	Transmission link from delegates' microphone to interpreters' headphone	**4.5**
f	Transmission link from delegates' microphone to delegates' headphone	**4.6**
g	Transmission link from interpreters' microphone to delegates' headphone	**4.5**
h	Transmission link from interpreters' microphone to interpreters' headphone	**4.5**
i	Auxiliary input link to interpreters' headphone	**4.5**
j	Auxiliary input link to delegates' headphone	**4.6**
k	Auxiliary output link from delegates' microphone	**4.7**
l	Auxiliary output link from interpreters' microphone	**4.7**

TABLE 2 COMBINED UNITS

(*Clause* 4.1)

ITEM	DESCRIPTION	SUB-CLAUSE
a-e	Microphone for delegate with transmission link to interpreters' headphone	**4.8**
a-f	Microphone for delegate with transmission link to delegates' headphone	**4.9**
a-k	Microphone for delegate with auxiliary output	**4.8**
b-h	Microphone for interpreter with transmission link to interpreters' headphone	**4.8**
b-g	Microphone for interpreter with transmission link to delegates' headphone	**4.8**
b-l	Microphone for interpreter with auxiliary output	**4.8**

4.2 Microphones (*see* items *a* and *b*)

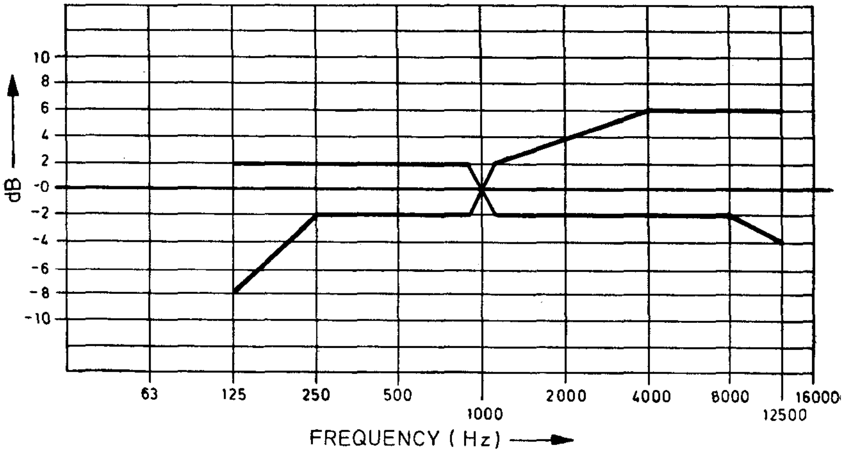


Sl No.	Characteristic	Method of Measurement	Requirements
1.	Frequency response	According to **9.6** of IS : 9302 (Part 3)-1981*, within the frequency range 125 to 12 500 Hz	Type frequency response shall fall within the tolerance field of Fig. 2 (*see* Note). Frequency response curve of any individual microphone shall correspond to the type frequency response within a tolerance of ± 3 dB
2.	Free field sensitivity	According to **9.3.1** of IS : 9302 (Part 3)-1981*	Sensitivity at a sound pressure level of 80 dB (ref 20 μPa) shall provide the rate input level of the corresponding transmission links. Furthermore, the sensitivity of an individual microphone shall not differ by more than ± 3 dB from the rated sensitivity at 1 000 Hz
3.	Directional pattern	According to **9.8.12**(b) of IS: 9302 (Part 3)-1981*, within the frequency range 250 to 8 000 Hz in an angle between 30 and 120°	Off-axis frequency response shall not deviate by more than ± 4 dB from the axial response. Where the sensitivity at any angle and frequency is more than 12 dB below the axial response at the same frequency, the deviation of the response at that angle and frequency shall be neglected
4.	Front-to-random sensitivity index (for directional microphones)	According to **9.8.2** of IS : 9302 (Part 3)-1981* within the frequency range 250 to 8 000 Hz	⩾ 3 dB

(*Continued*)

SL No.	CHARACTERISTIC	METHOD OF MEASUREMENT	REQUIREMENTS
5.	Rated equivalent sound pressure level due to inherent noise	According to **9.10** of IS : 9302 (Part 3)-1981*	⩽ 25 dB (ref 20 µPa) rms noise, frequency A-weighted
6.	Total harmonic distortion (under overload conditions)	According to **9.9** of IS : 9302 (Part 3)-1981* within the frequency range 250 to 8 000 Hz for sound pressure levels up to 110 dB (ref 20 µPa)	⩽ 1 percent

*Characteristics and methods of measurements for sound system equipment: Part 3 Microphones.

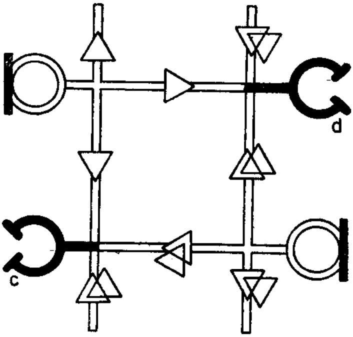


NOTE — For equal applications within a specified system, microphones with a similar type frequency response should be used.

FIG. 2 MICROPHONE FREQUENCY RESPONSE TOLERANCE FIELD

4.3 Supra-aural Headphones (*see* items *c* and *d*)

NOTE — Earphones connected in parallel are preferred.



SL No.	CHARACTERISTIC	METHOD OF MEASUREMENT	REQUIREMENTS
1.	Frequency response	According to **8.2.2** of IS : 9302 (Part 6)-1986* within the frequency range 125 to 12 500 Hz	Type frequency response shall fall within the tolerance field of Fig. 3. Frequency response curve of any individual headphone shall correspond to the type frequency response within a tolerance of ± 3 dB
2.	Difference of the frequency response of a headphone having two earphones	According to **8.2.1** of IS : 9302 (Part 6)-1986* within the frequency range 250 to 2 000 Hz	Frequency response of two single earphones of a headphone shall not deviate more than 3 dB
3.	Electrical impedance	According to **8.1** of IS : 9302 (Part 6)-1986* within the frequency range 250 to 2 000 Hz	Impedence for *wired* systems shall not be less than 80 percent of the rated value and > 150 ohm. The impedance for *wireless* systems shall be appropriate for the receiver used
4.	Maximum noise voltage (former title: voltage handling capacity)	According to 2.5 of IS : 9302 (Part 6)-1986* within the frequency range 125 to 12 500 Hz	For *wired* systems: ⩾ 5V For *wireless* systems greater or equal to the maximum output voltage for the receiver used
5.	Characteristic voltage	According to **2.4** of IS : 9302 (Part 6)-1986*	⩽ 1V

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*Characteristics and methods of measurements for sound system equipment: Part 6 Headphones and headsets.

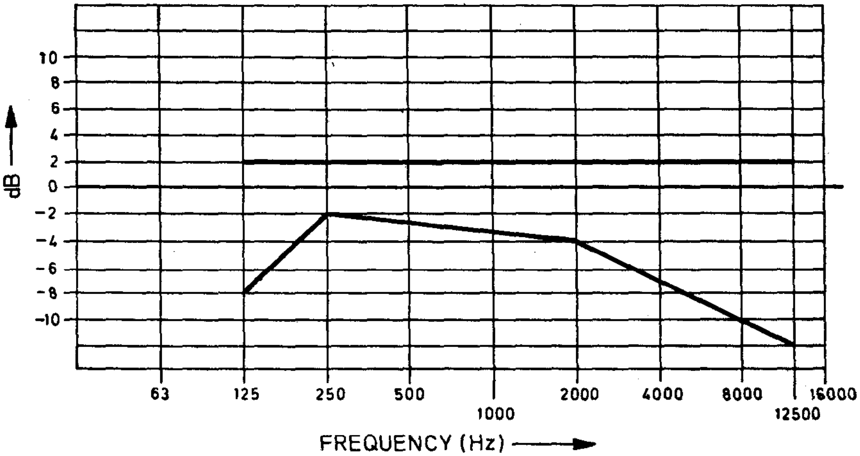
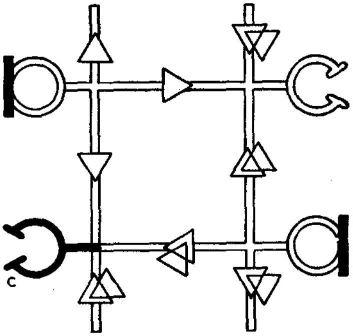


FIG. 3 SUPRA-AURAL HEADPHONE TYPE FREQUENCY RESPONSE TOLERANCE FIELD

4.4 Stethoscopic Headphones and Earshells (*see* item *c*)



SL No.	CHARACTERISTIC	METHOD OF MEASUREMENT	REQUIREMENTS
1.	Frequency response	According to **8.2.2** of IS : 9302 (Part 6)-1986* within the frequency range 250 to 4 000 Hz	Type frequency response shall fall within the tolerance field of Fig. **4**. Frequency response curve of any individual headphone or earshell shall correspond to the type frequency response within a tolerance of ± 4 dB

(Continued)

Sl No.	Characteristic	Method of Measurement	Requirements
2.	Difference of frequency of a headphone having two earphones	According to **8.2.1** of IS : 9302 (Part 6)-1986* within the frequency range 250 to 4 000 Hz	Frequency response of two single earphones of a headphone shall not deviate more than 3 dB
3.	Electrical impedance	According to **8.1** of IS : 9302 (Part 6)-1986* within the frequency range 250 to 2 000 Hz	Impedance for *wired* systems shall not be less than 80 percent of the rated value and > 150 ohms. The impedance for *wireless* systems may be adapted to the corresponding receiver
4.	Maximum noise voltage (former title: Voltage handling capacity)	According to **2.5** of IS : 9302 (Part 6)-1986* within the frequency range 250 to 4 000 Hz	For *wired* systems: ⩾ 5 V For *wireless* systems greater or equal to the maximum output voltage of the corresponding receiver
5.	Characteristic voltage	According to **2.4** of IS : 9302 (Part 6)-1986*	⩽ 1V

*Characteristics and methods of measurements for sound system equipment: Part 6 Headphones and headsets.

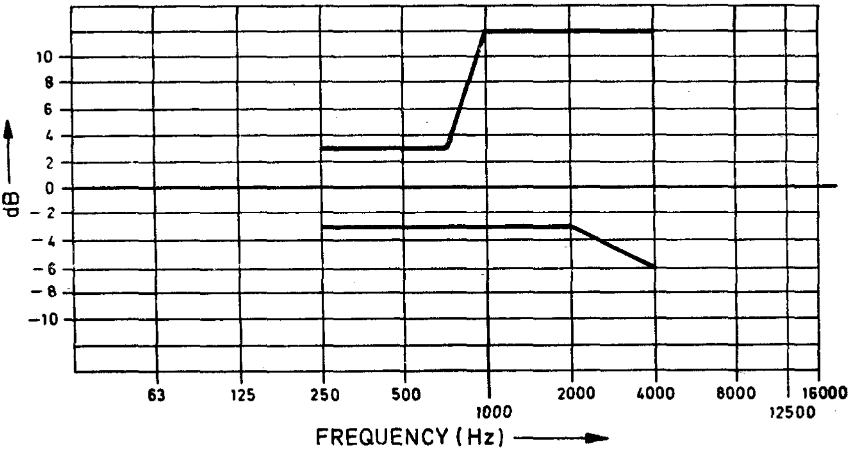
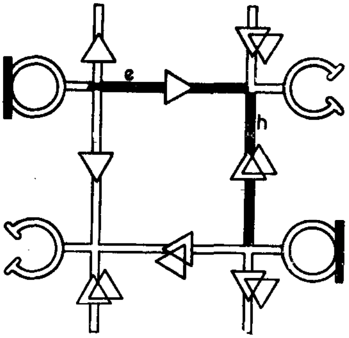
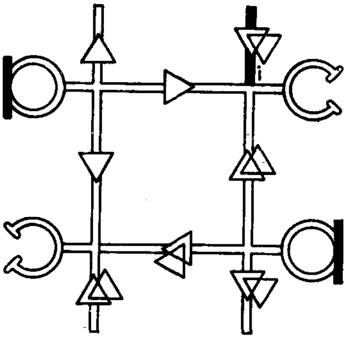


FIG. 4 STETHOSCOPIC HEADPHONE AND EARSHELL TYPE FREQUENCY RESPONSE TOLERANCE FIELD

4.5 Transmission Links (*see* items *e* and *h*)

Auxiliary Input Links (*see* item *i*)





Sl No.	Characteristic	Method of Measurements (*see* Note)	Requirements
1.	Frequency response	According to **8.19** of IS : 9302 (Part 2)-1979* within the frequency range 125 to 12 500 Hz	Type frequency response shall fall within the tolerance field of Fig. 5
2.	Total harmonic distortion (under normal working conditions)	According to **8.22** of IS : 9302 (Part 2)-1979* within the frequency range 200 to 8 000 Hz; however, the source emf is adjusted to the rated source emf	⩽ 1 percent
3.	Total harmonic distortion (under overload conditions)	According to **9.9** of IS : 9302 (Part 3)-1981† for sound pressure levels up to 110 dB SPL (ref 20 μPa) and **8.22** of IS : 9302 (Part 2)-1979*. However, the volume control is set to a position that the output voltage is —10 dB related to V 1, within the frequency range 250 to 1 000 Hz and a decrease of the sound pressure level by 12 dB/octave in the frequency range 1 000 to 8 000 Hz	⩽ 5 percent
4.	Cross talk attenuation	According to **8.42** of IS : 9302 (Part 2)-1979* within the frequency range 250 to 4 000 Hz	> 60 dB
5.	Weighted signal-to-noise ratio	According to **8.25.2** of IS : 9302 (Part 2)-1979*	> 60 dB related to the rated input level

(*Continued*)

Sl No.	Characteristic	Method of Measurement (*see* Note)	Requirements
6.	Overall voltage gain	According to **8.15** of IS: 9302 (Part 2)-1979* within the input voltage from the sources specified in IS : 9302 (Part 10)-1980‡	1 V across an output load of 150 ohms at the input of the headphone connection (this is a rated output condition)

Note — In any case where normal working conditions are mentioned, the values shall be fixed by an output voltage of 1 V across an output load of 150 ohms (rated output condition) within the frequency range 125 to 12 500 Hz. For *wireless systems*, the rated field strength shall also be stated.

Characteristics and methods of measurements for sound system equipment:

*Part 2 Amplifiers.

†Part 3 Microphones.

‡Part 10 Preferred matching values for the interconnection of sound system components

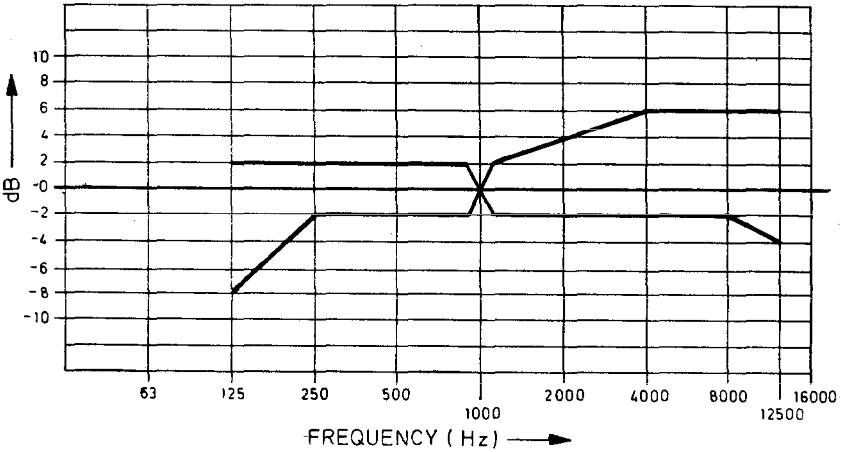
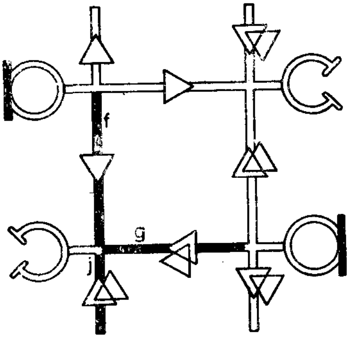


FIG. 5 TYPE FREQUENCY RESPONSE OF THE TRANSMISSION LINK — TOLERANCE FIELD

4.6 Transmission Links (*see* items *f* and *g*)

Auxiliary Input Links (*see* item *j*)



SL No.	CHARACTERISTIC	METHOD OF MEASUREMENT (*see* NOTE 1)	REQUIREMENTS
1.	Frequency response	According to **8.19** of IS : 9302 (Part 2)-1979* within the frequency range 250 to 3 150 Hz or 250 to 6 300 Hz, as chosen (*see* Note 2)	Type frequency response shall fall within the tolerance field of Fig. 6
2.	Total harmonic distortion	According to **8.22** of IS : 9302 (Part 2)-1979* within the frequency range 250 Hz to 3 150 Hz or 250 to 6 300 Hz, as chosen (*see* Note 2)	$\leqslant$ 4 percent
3.	Cross talk attenuation	According to **8.42** of IS : 9302 (Part 2)-1979* within the frequency range 250 to 3 150 Hz or 250 to 6 300 Hz, as chosen (*see* Note 2)	For the small frequency range: $\geqslant$ 40 dB. For the wide fre-range: $\geqslant$ 50 dB
4.	Weighted signal-to-noise ratio	According to **8.26.2** of IS : 9302 (Part 2)-1979*	For the small frequency range: $\geqslant$ 40 dB. For the wide frequency range: $\geqslant$ 50 dB

*Characteristics and methods of measurements of sound system equipment: Part 2 Amplifiers.

NOTE 1 — In any case where normal working conditions are mentioned, the values shall be fixed by an output voltage of 1 V across an output load of 150 ohms (rated output condition) within the frequency range 125 to 12 500 Hz. For *wireless systems*, the rated field strength shall also be stated.

NOTE 2 — Differences in the frequency range are based on different systems for sound transmission. Systems having a higher maximum frequency, in general, result in better intelligibility.

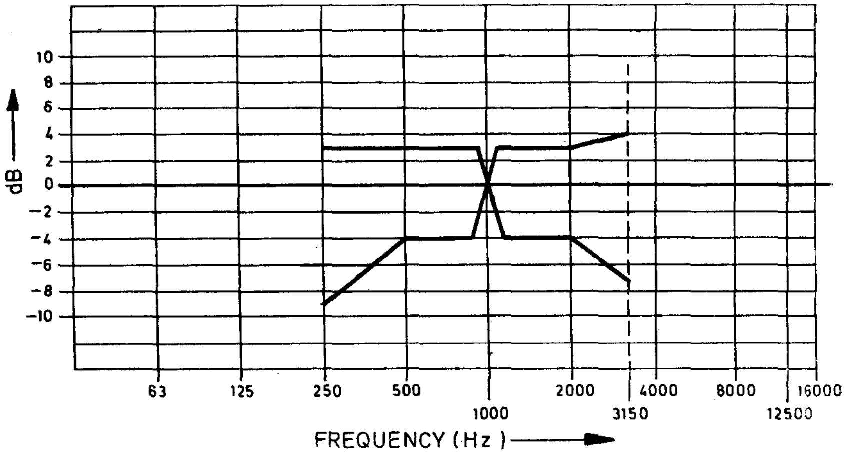


FIG. 6A TYPE FREQUENCY RESPONSE OF THE TRANSMISSION LINK- — TOLERANCE FIELD (FOR SMALL FREQUENCY RANGE)

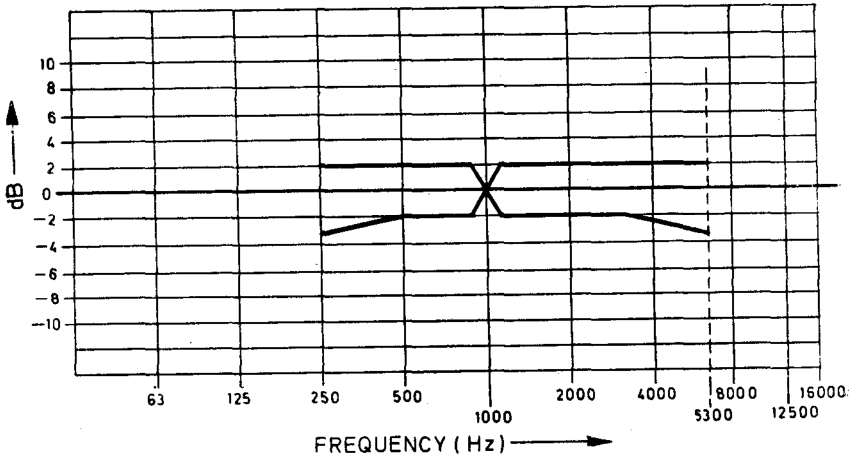
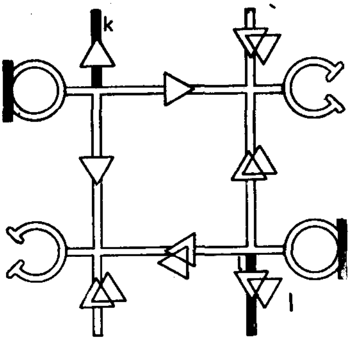


FIG. 6B TYPE FREQUENCY RESPONSE OF THE TRANSMISSION LINK- — TOLERANCE FIELD (FOR THE WIDE FREQUENCY RANGE)

4.7 Auxiliary Output Links (*see* items *k* and *l*)



SL No.	CHARACTERISTIC	METHOD OF MEASUREMENT	REQUIREMENTS
1.	Frequency response	According to **8.19** of IS : 9302 (Part 2)-1979* within the frequency range 125 to 12 500 Hz	Type frequency response shall fall within the tolerance field of Fig. 7
2.	Total harmonic distortion	According to **8.22** of IS : 9302 (Part 2)-1979* within the frequency range 125 to 12 500 Hz	⩽ 1 percent
3.	Cross talk attenuation	According to **8.42** of IS : 9302 (Part 2)-1979* within the frequency range 250 to 4 000 Hz	⩾ 60 dB
4.	Weighted signal-to-noise ratio	According to **8.26.2** of IS : 9302 (Part 2)-1979*	⩾ 60 dB

*Characteristics and methods of measurements of sound system equipment: Part 2 Amplifiers.

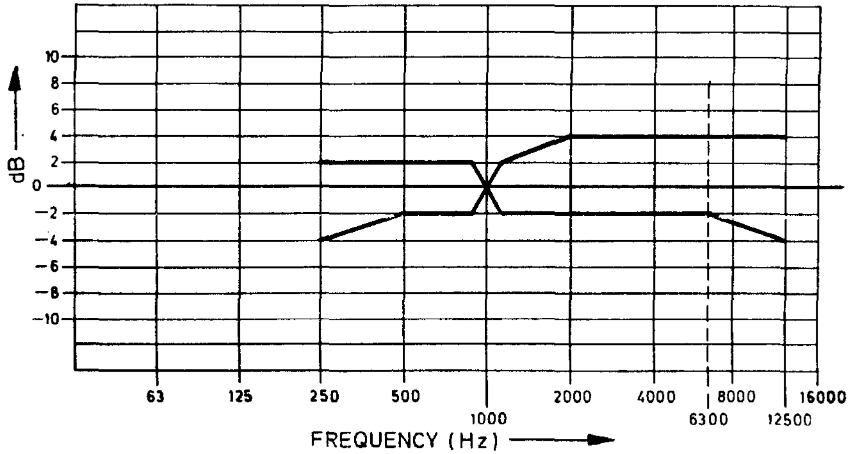
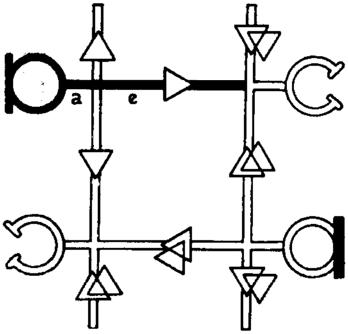
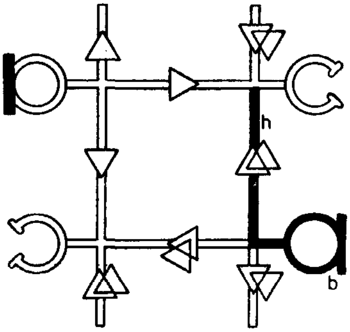
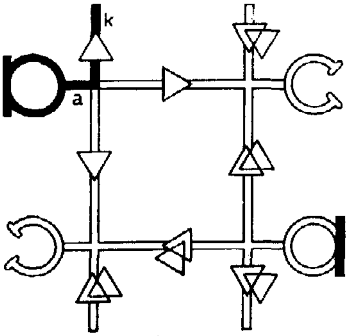


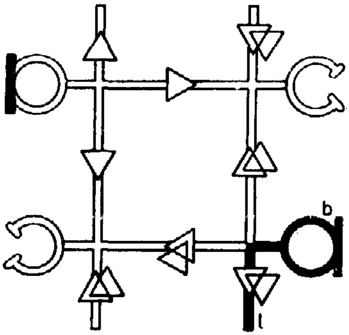
FIG. 7 TYPE FREQUENCY RESPONSE OF THE AUXILIARY OUTPUT LINKS — TOLERANCE FIELD

4.8 Combined Units (*see* items *a-e*, *b-h*, *a-k* and *b-l*)









SL No.	CHARACTERISTIC	METHOD OF MEASUREMENT	REQUIREMENTS
1.	Frequency response	According to **9.6** of IS : 9302 (Part 3)-1981* and **8.19** of IS : 9302 (Part 2)-1979† within the frequency range 125 to 12 500 Hz	Type frequency response shall fall within the tolerance field of Fig. 8. Frequency response curve of any individual chain shall correspond to the type frequency response within a tolerance of ± 3 dB
2.	Free field sensitivity	According to **9.3.1** of IS : 9302 (Part 3)-1981*	Sensitivity at a sound pressure level of 80 dB (ref 20 µPa) shall provide the rated input level of the corresponding transmission links. Furthermore, the sensitivity of an individual microphone shall not differ by more than ± 3 dB from the rated sensitivity at 1 000 Hz
3.	Directional pattern of the microphone	According to **9.8.12**(b) of IS : 9302 (Part 3)-1981* within the frequency range 250 to 8 000 Hz in an angle between 30 and 120°	Off-axis frequency response shall not deviate by more than ± 4 dB from the axial response. Where the sensitivity at any angle and frequency is more than 12 dB below the axial response at the same frequency, the deviation of the response at that angle and frequency shall be neglected
4.	Front-to-random sensitivity index (for directional microphones)	According to **9.8.2** of IS : 9302 (Part 3)-1981* within the frequency range 250 to 8 000 Hz	⩾ 3 dB
5.	Rated equivalent sound pressure level due to inherent noise	According to **8.26.2** of IS : 9302 (Part 2)-1979†. The input noise can be calculated. For the microphone, reference is made to **4.2**. The total value of the input noise is obtained by calculation	⩽ 32 dB SPL (ref 20 µPa) rms
6.	Total harmonic distortion (under normal working conditions)	With the microphone under rated conditions according to **3.1** of IS : 9302 (Part 3)-1981* and the amplifier according to **4** of IS : 9302 (Part 2)-1979†. However, for the combination *a-e* and *b-h*, the volume control is set to a position that the output voltage is 1 V across an output load of 150 ohms (this is a rated output condition) within the frequency range 250 to 8 000 Hz	⩽ 2 percent

(*Continued*)

SL No.	CHARACTERISTIC	METHOD OF MEASUREMENT	REQUIREMENTS
7.	Total harmonic distortion (under overload conditions)	According to **9.9** of IS : 9302 (Part 3)-1981* for sound pressure levels up to 110 dB SPL (ref 20 µPa) and **8.22** of IS : 9302 (Part 2)-1979†, However, the volume control is set to a position that output voltage is — 10 dB related to 1 V, within the frequency range 250 to 1 000 Hz and a decrease of the sound pressure level by 12 dB/octave in the frequency range 1 000 to 8 000 Hz	⩽ 5 percent
8.	Cross talk attenuation	According to **8.42** of IS : 9302 (Part **2**)-1979† within the frequency range 250 to 4 000 Hz.	⩾ 60 dB

Characteristics and methods of measurements for sound system equipment:

*Part 3 Microphones.
†Part 2 Amplifiers.

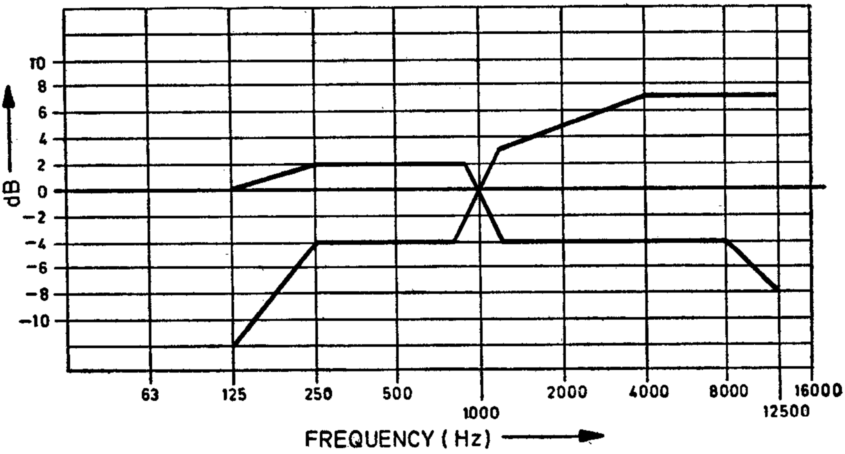
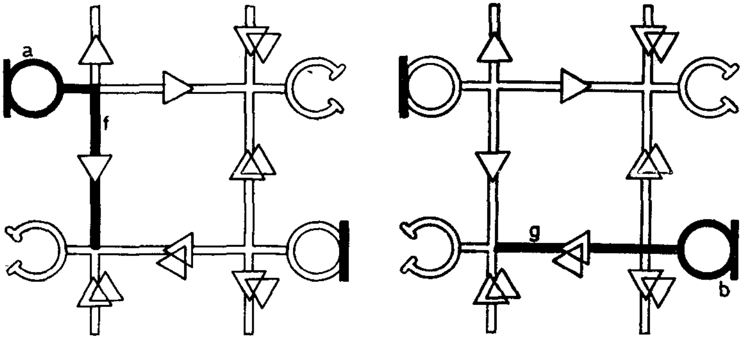


FIG. 8 TYPE FREQUENCY RESPONSE OF THE COMBINED UNIT AS SPECIFIED IN **4.8** — TOLERANCE FIELD

4.9 Combined Units (*see* items *a-f* and *b-g*)



SL No.	CHARACTERISTIC	METHOD OF MEASUREMENT (*see* NOTE 1)	REQUIREMENTS
1.	Frequency response	According to **9.6** of IS : 9302 (Part 3)-1981* and **8.19** of IS : 9302 (Part 2)-1979† within the frequency range 250 to 3 150 Hz or 250 to 6 300 Hz, as chosen (*see* Note 2)	Type frequency response shall fall within the tolerance field of Fig. 9. Frequency response curve of any individual chain shall correspond to the type frequency response within a tolerance of ± 3 dB
2.	Free field sensitivity	According to **9.3.1** of IS : 9302 (Part 3)-1981*	Sensitivity at a sound pressure level of 80 dB (ref 20 µPa) shall provide the rated input level of the corresponding transmission links. Furthermore, the sensitivity of an individual microphone shall not differ by more than ± 3 dB from the rated sensitivity at 1 000 Hz
3.	Directional pattern of the microphone	According to **9.8.12**(b) of IS : 9302 (Part 3)-1981* within the frequency range chosen in an angle between 30 and 120°	Off-axis frequency response shall not deviate by more than ± 4 dB from the axial response. Where the sensitivity at any angle and frequency is more than 12 dB below the axial response at the same frequency, the deviation of the response at that angle and frequency shall be neglected
4.	Front-to-random sensitivity index (for directional microphones)	According to **9.8.2** of IS : 9302 (Part 3)-1981* within the frequency range chosen	⩾ 3 dB

(*Continued*)

Sl No.	Charac-teristic	Method of Measurement	Requirements
5.	Rated equivalent sound pressure level due to inherent noise	According to **8.26.2** of IS : 9302 (Part 2)-1979†. The input noise can be calculated. For the microphone, reference is made to **4.2**. The total value of the input noise is obtained by calculation	⩽ 40 dB SPL (ref 20 µPa) rms (for both specified frequency ranges)
6.	Total harmonic distortion (under normal working conditions)	With the microphone under rated conditions according to **3.1** of IS : 9302 (Part 3)-1981* and the amplifier according to **4** of IS : 9302 (Part 2)-1979† a) when the headphone is not specified, the volume control set to a position that the output voltage is 1 V across an output load of 150 ohms (this is a rated output condition) within the frequency range chosen b) when the headphone is specified, the volume control set to a position that the output voltage is corresponding to an output level of 94 dB SPL (ref 20 µPa) of the specified headphone, the output load being equal to the impedance of the specified headphone: within the frequency range chosen	⩽ 4 percent
7.	Total harmonic distortion (under overload conditions)	According to **9.9** of IS : 9302 (Part 3)-1981* for sound pressure levels up to 110 dB SPL (ref 20 µPa) and **8.22** of IS : 9302 (Part 2)-1979† a) when the headphone is not specified, the volume control is set to a position that the output voltage is — 10 dB related to 1 V, within the frequency range chosen b) when the headphone is specified, the output voltage is — 10 dB related to the output level of 94 dB SPL (ref 20 µPa) of the specified headphone, within the frequency range chosen	⩽ 8 percent
8.	Cross talk attenuation	According to **8.42** of IS : 9302 (Part 2)-1979†, within the frequency range chosen (*see* Note 2)	For the small frequency range: ⩾ 40 dB. For the wide frequency range: ⩾ 50 dB

(*Continued*)

NOTE 1 — The frequency bands mentioned in **4.9.3**, **4.9.4**, **4.9.6** and **4.9.7** are only required for separate microphones *a* and *b*. For the combination equipment the maximum frequency range is mentioned in **4.9.1**.

NOTE 2 — Differences in the frequency range are based on different systems for sound transmission. Systems having a higher maximum frequency, in general, result in better intelligibility.

Characteristics and methods of measurements for sound system equipment:

*Part 3 Microphones.

†Part 2 Amplifiers.

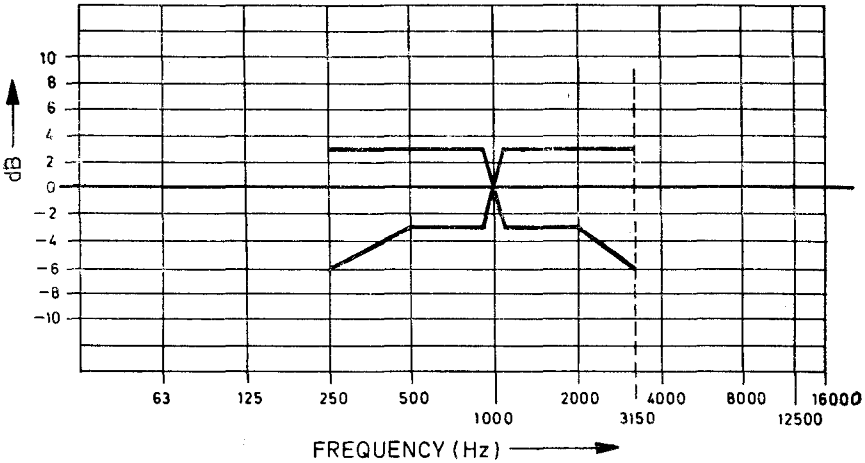


FIG. 9A TYPE FREQUENCY RESPONSE OF THE COMBINED UNIT AS SPECIFIED IN **4.9** — TOLERANCE FIELD (FOR SMALL FREQUENCY RANGE)

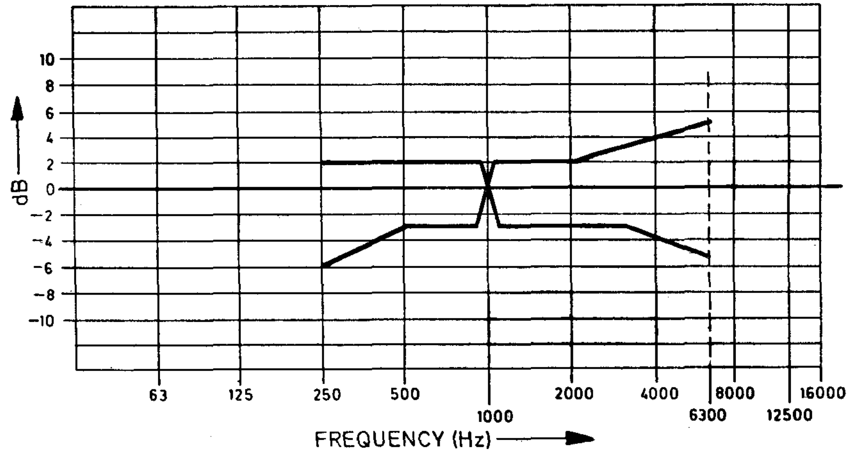
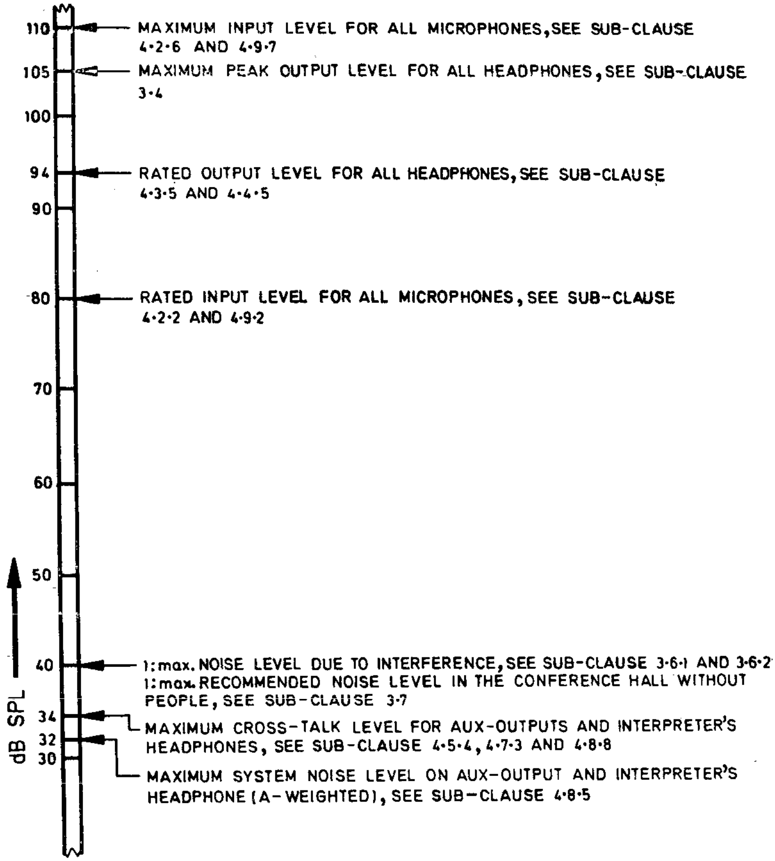


FIG. 9B TYPE FREQUENCY RESPONSE OF THE COMBINED UNIT AS SPECIFIED IN **4.9** — TOLERANCE FIELD (FOR WIDE FREQUENCY RANGE)

APPENDIX A

(*Clause* 0.3)

SCALE FOR SYSTEM PARAMETERS


110
105
100
94
90
80
70
60
50
40
34
32
30
dB SPL
MAXIMUM INPUT LEVEL FOR ALL MICROPHONES, SEE SUB-CLAUSE 4·2·6 AND 4·9·7
MAXIMUM PEAK OUTPUT LEVEL FOR ALL HEADPHONES, SEE SUB-CLAUSE 3·4
RATED OUTPUT LEVEL FOR ALL HEADPHONES, SEE SUB-CLAUSE 4·3·5 AND 4·4·5
RATED INPUT LEVEL FOR ALL MICROPHONES, SEE SUB-CLAUSE 4·2·2 AND 4·9·2
1: max. NOISE LEVEL DUE TO INTERFERENCE, SEE SUB-CLAUSE 3·6·1 AND 3·6·2
1: max. RECOMMENDED NOISE LEVEL IN THE CONFERENCE HALL WITHOUT PEOPLE, SEE SUB-CLAUSE 3·7
MAXIMUM CROSS-TALK LEVEL FOR AUX-OUTPUTS AND INTERPRETER'S HEADPHONES, SEE SUB-CLAUSE 4·5·4, 4·7·3 AND 4·8·8
MAXIMUM SYSTEM NOISE LEVEL ON AUX-OUTPUT AND INTERPRETER'S HEADPHONE (A-WEIGHTED), SEE SUB-CLAUSE 4·8·5

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